

WE CLAIM:

1. A vehicle suspension system, comprising

a first shock absorber comprising a first main piston disposed therein, said first main piston being moveable between a retracted position wherein said first main piston is substantially retracted within said first shock absorber and an extended position wherein said first main piston is at least partially extended from said first shock absorber;

a second shock absorber comprising a second main piston disposed therein, said second main piston being moveable between a retracted position wherein said second main piston is substantially retracted within said second shock absorber and an extended position wherein said second main piston is at least partially extended from said first shock absorber;

wherein said first and second shock absorbers motivelly linked with one another whereby when said first main piston is moved toward said retracted position, said second main piston is caused to move toward said retracted position.
2. The vehicle suspension system according to claim 1, wherein

said first and second main pistons are in phase, such that when said first main piston moves towards said retracted position, said second main piston moves towards said retracted position.
3. The vehicle suspension system according to claim 1, further comprising

an adjustor in communication with said first and second main pistons, said adjustor being adapted for adjusting a neutral position of said first and second main pistons.
4. The vehicle suspension system according to claim 1, wherein

- said first and second shock absorbers are hydraulic shock absorbers.
5. The vehicle suspension system according to claim 4, further comprising a remote reservoir mechanism adapted to accommodate motions of said first and second main pistons.
 6. The vehicle suspension system according to claim 4, wherein said first and second shock absorbers comprise hydraulic fluid therein.
 7. The vehicle suspension system according to claim 6, wherein said hydraulic fluid is synthetic hydraulic oil.
 8. The vehicle suspension system according to claim 6, wherein said hydraulic fluid is a medium-weight hydraulic oil.
 9. The vehicle suspension system according to claim 6, wherein said hydraulic fluid is a light-weight hydraulic oil.
 10. The vehicle suspension system according to claim 6, wherein said vehicle suspension system is adapted to substantially avoid cavitation of said hydraulic fluid.
 11. The vehicle suspension system according to claim 6, wherein

said vehicle suspension system is adapted to be operable during cavitation of said hydraulic fluid.

12. The vehicle suspension system according to claim 1, wherein

 said first shock absorber is a hydraulic shock absorber defining a first hydraulic chamber therein, wherein a volume of said first hydraulic chamber is smaller when said first main piston is in said retracted position than when said first main piston is in said extended position;

 said second shock absorber is a hydraulic shock absorber defining a second hydraulic chamber therein, wherein increasing a volume of said second hydraulic chamber causes said second main piston to move toward said retracted position;

 said second hydraulic chamber being in hydraulic communication with said first hydraulic chamber, wherein decreasing said volume of said first hydraulic chamber increases said volume of said second hydraulic chamber;

 whereby when said first main piston is moved towards said retracted position, said volume of said first hydraulic chamber is decreased, whereby said volume of said second hydraulic chamber is increased, whereby said second main piston moves toward said retracted position.

13. The vehicle suspension system according to claim 12, wherein

 said second shock absorber defines a third hydraulic chamber therein adjacent to said second hydraulic chamber, wherein increasing said volume of said second hydraulic chamber decreases a volume of said third hydraulic chamber.

14. The vehicle suspension system according to claim 12, further comprising

 an adjustor comprising an adjustor piston disposed in said adjustor, said adjustor piston being moveable between a retracted position wherein said adjustor piston is

substantially retracted within said adjustor and an extended position wherein said adjustor piston is at least partially extended from said adjustor;

wherein moving said adjustor piston adjusts a neutral position of said second main piston.

15. The vehicle suspension system according to claim 14, wherein
said adjustor defines a fourth hydraulic chamber therein in fluid communication with said first and second hydraulic chambers such that changing a volume of said fourth hydraulic chamber changes at least one of said volumes of said first hydraulic chambers.

16. The vehicle suspension system according to claim 15, wherein
moving said adjustor piston toward said retracted position decreases a volume of said fourth hydraulic chamber; and
decreasing a volume of said fourth hydraulic chamber increases said volume of said second hydraulic chamber, such that said separator piston moves towards said second main piston, whereby said second main piston moves towards said retracted position thereof.

17. The vehicle suspension system according to claim 15, wherein
said adjustor defines a first pneumatic chamber therein adjacent to said fourth hydraulic chamber, such that increasing a volume of said first pneumatic chamber decreases a volume of said fourth hydraulic chamber; and
decreasing a volume of said fourth hydraulic chamber increases said volume of said first hydraulic chamber, such that said first main piston moves towards said extended position thereof, whereby said second main piston moves towards said retracted position thereof.

18. The vehicle suspension system according to claim 13, further comprising
a remote reservoir mechanism adapted to accommodate motions of said first and
second main pistons, said remote reservoir mechanism comprising a remote reservoir
piston disposed in said remote reservoir mechanism, said remote reservoir piston being
moveable between a retracted position wherein said remote reservoir piston is
substantially retracted within said remote reservoir mechanism and an extended position
wherein said remote reservoir piston is at least partially extended from said remote
reservoir mechanism;

said remote reservoir mechanism defining a fifth hydraulic chamber therein in
hydraulic communication with said third hydraulic chamber, such that decreasing said
volume of said third hydraulic chamber increases a volume of said fifth hydraulic
chamber;

said remote reservoir mechanism defining a pressure means chamber therein in
communication with said fifth hydraulic chamber, such that increasing said volume of
said fifth hydraulic chamber decreases a volume of said pressure means chamber.

19. The vehicle suspension system according to claim 13, wherein

said second hydraulic chamber defines central portion and a passage portion
disposed peripherally to said central portion, said passage portion being in hydraulic
communication with said first hydraulic chamber, said central portion being in
hydraulic communication with said passage portion.

20. The vehicle suspension system according to claim 19, wherein

said passage portion comprises a plurality of tubes.

21. The vehicle suspension system according to claim 19, wherein

- 47
- said passage portion comprises one tube.
22. The vehicle suspension system according to claim 20, wherein
 said tubes are approximately .160 inches in diameter.
23. The vehicle suspension system according to claim 19, wherein
 said passage portion comprises a cylindrical shell.
24. The vehicle suspension system according to claim 12, further comprising
 a first hydraulic line connecting said first and second hydraulic chambers.
25. The vehicle suspension system according to claim 19, further comprising
 a first hydraulic line connecting said first hydraulic chamber and said passage
 portion of said second hydraulic chamber.
26. The vehicle suspension system according to claim 13, further comprising
 a second hydraulic line connecting said second and fourth hydraulic chambers.
27. The vehicle suspension system according to claim 18, further comprising
 a third hydraulic line connecting said third and fifth hydraulic chambers.
28. The vehicle suspension system according to claim 14, wherein
 said first, second, and fourth hydraulic chambers are substantially filled with a
 first hydraulic fluid.

29. The vehicle suspension system according to claim 28, wherein
said first hydraulic fluid is synthetic hydraulic oil.
30. The vehicle suspension system according to claim 28, wherein
said first hydraulic fluid is medium-weight hydraulic oil.
31. The vehicle suspension system according to claim 28, wherein
said first hydraulic fluid is light-weight hydraulic oil.
32. The vehicle suspension system according to claim 18, wherein
said third and fifth hydraulic chambers are substantially filled with a second
hydraulic fluid.
33. The vehicle suspension system according to claim 32, wherein
said second hydraulic fluid is synthetic hydraulic oil.
34. The vehicle suspension system according to claim 32, wherein
said second hydraulic fluid is medium-weight hydraulic oil.
35. The vehicle suspension system according to claim 28, wherein
said second hydraulic fluid is light-weight hydraulic oil.
36. The vehicle suspension system according to claim 17, wherein

- said first pneumatic chamber is substantially filled with a first pneumatic fluid.
37. The vehicle suspension system according to claim 36, wherein
said first pneumatic fluid is air.
38. The vehicle suspension system according to claim 18, wherein
said pressure means chamber is substantially filled with a second pneumatic
fluid.
39. The vehicle suspension system according to claim 38, wherein
said second pneumatic fluid is compressed nitrogen.
40. The vehicle suspension system according to claim 38, wherein
said second pneumatic fluid is compressed air.
41. The vehicle suspension system according to claim 18, wherein
said pressure means chamber comprises a compression spring therein.
42. The vehicle suspension system according to claim 12, wherein
at least one of said first and second shock absorbers comprises at least one o-
ring.
43. The vehicle suspension system according to claim 42, wherein

said at least one o-ring comprises at least one of the group consisting of nitrile and fluoroelastomer.

44. The vehicle suspension system according to claim 15, wherein said adjustor comprises at least one o-ring.
45. The vehicle suspension system according to claim 44, wherein said at least one o-ring comprises at least one of the group consisting of nitrile and fluoroelastomer.
46. The vehicle suspension system according to claim 18, wherein said remote reservoir mechanism comprises at least one o-ring.
47. The vehicle suspension system according to claim 46, wherein said at least one o-ring comprises at least one of the group consisting of nitrile and fluoroelastomer.
48. The vehicle suspension system according to claim 12, further comprising a restrictor between said first and second hydraulic chambers, said restrictor being adapted to control fluid communication between said first and second hydraulic chambers.
49. The vehicle suspension system according to claim 18, further comprising

a bleed-back valve between said third and fifth hydraulic chambers, said bleed-back valve being adapted to control fluid communication between said third and fifth hydraulic chambers.

50. The vehicle suspension system according to claim 4, wherein
- said first main piston comprises a first damping valve, such that fluid within said first hydraulic shock absorber moves through said first damping valve as said first main piston moves between said extended and said retracted positions in such a fashion as to minimize cavitation of said fluid; and
- said second main piston comprises a second damping valve, such that fluid within said second hydraulic shock absorber moves through said second damping valve as said second main piston moves between said extended and retracted positions in such a fashion as to minimize cavitation of said fluid.